



August 11, 2010

Ellen Haertle
Department of Toxic Substances Control
P.O. Box 806
Sacramento, California 95812

Re: Comments on DTSC Proposed Solar Panel Management Regulations

Dear Ms. Haertle:

Pursuant to the Department of Toxic Substances Control (DTSC) request for written comments on DTSC's draft regulation on the management of waste solar panels, The California Solar Energy Industries Association, Solar Alliance and the Solar Energy Industries Association submit the following comments.

A. Proposed Revisions to Description of Regulations

As currently drafted, the cover page of the proposed regulations describes the creation of "three management options." This description of the proposed regulatory package is unnecessarily complicated and may confuse the public and the regulated community.

DTSC should explain that the baseline classification for waste solar panels is universal waste. For example, DTSC does not state that the generator of an electronic device has an option as to whether to handle the waste as a universal or hazardous waste. Instead, DTSC states that waste batteries *are* universal wastes, and thereafter elaborates through a sub-section that electronic devices managed as hazardous wastes cannot be managed as universal wastes (See 22 C.C.R. § 66273.7(b)(6)).

Describing universal waste as the baseline for waste solar panels will preserve the existence of what is currently described in the write-up as the option to manage waste solar panels under the "full hazardous waste regulations." DTSC has already proposed a provision in the solar panel applicability provision that is identical to the electronic device provision described above. See § 66273.7.1(b)(4). Given that "full hazardous waste regulation" is already an option contained in the universal waste baseline, there is no reason to potentially confuse the public and regulated community by describing "full hazardous waste regulation" as a separate regulatory option.

Similarly, the Department should describe the exemption for solar panels managed as recyclable materials pursuant to § 66261.6 as an exemption from the universal waste regulations rather than as a separate option that is “not mutually exclusive” with the universal waste classification. By doing so, the Department will not alter the proposed recyclable material exemption in any way, but will lessen potential confusion for the regulated community.

To make clear that the proposed regulatory package classifies waste solar panels as universal waste and creates an additional exemption from the regulatory requirements governing universal wastes for those entities that adhere to the requirements of section 66261.6, *DTSC should revise the cover page to read as follows:*

This document proposes regulatory amendments that provide for the appropriate regulation of waste solar panels that are currently regulated by the Department. presents two, proposed (new) options for the management of hazardous waste solar panels at end of life. Both options are not mutually exclusive, but are presented together so that a regulatory entity has a choice of management schemes. Absent these two regulatory conditional exemptions, hazardous waste solar panels must be managed under full hazardous waste regulations, which are California's current standards. Thus, as drafted, there would be three (3) options for management of hazardous waste solar panels: It proposes regulations that classify waste solar panels as universal wastes and waste solar panels will be regulated under that statutory scheme. The proposal creates an additional regulatory option for those panels that will be managed as recyclable materials. When recycled as “recyclable materials,” those panels will be subject only to the requirements of section 66261.6(a)(8)(A)-(I) governing recyclable materials and to the standards incorporated therein. Note that pursuant to the universal waste standards set forth in existing regulations, universal wastes destined for disposal must be handled as hazardous wastes.

1. ——— Full hazardous waste regulations (current standard)
2. ——— Conditional hazardous waste exemption (proposed)
3. ——— Universal waste management (proposed)

It is also important to note that once a regulatory scheme is chosen for the management of a particular hazardous waste solar panel, that scheme must be followed or that waste may no longer be subject to that particular exemption.

B. Comments on Regulations

1. Section 66260.10 Definition of “Solar Panel Vendor” Should be Revised to Ensure that Vendors may use Third Parties to Perform Duties on Their Behalf

It is unclear whether the proposed definition for “Solar Panel Vendor” in § 66260.10 will allow solar panel manufacturers, producers, marketers and distributors to conduct current and proposed recycling activities under contract with third-parties. Third-party administration of section 66261.6 recycling activities will allow for specialization and aggregation of recycling expertise, which will ultimately reduce the cost of recycling solar panels. Third-party administration of recycling activities should, therefore, be encouraged. During the July 28 workshop, DTSC staff stated that the proposed regulation was intended to allow for third-party recycling. However, as currently drafted it is not clear that the definition of “Solar Panel Vendor” allows for third-party administration of recycling.

To increase the clarity of the section, the department should amend the definition of “Solar Panel Vendor” to explicitly include third-party entities that administers a solar panel reclamation program on behalf of a manufacturer, producer, marketer or distributor of solar panels in California. *The Department may do so by amending section 66260.10 to read as follows:*

"Solar Panel Vendor" means the manufacturer, producer, marketer or distributor of solar panels located within the United States and its territories, or a third-party entity acting on behalf of such manufacturer, producer, marketer or distributor, who administers a solar panel reclamation program and who accepts (for reclamation) one or more solar panels that are subject to the conditions for the exemption in section 66261.6 of chapter 11 of this division.

2. Section 66261.6(a)(3)(D) Should be Revised to Facilitate Recycling of Panels and to Remove Redundant Language

Currently, the proposed section 66261.6(a)(3)(D) modifies regulatory requirements for solar panels that are properly recycled, but the panels are still classified as California-only hazardous wastes. The Department, in providing a recyclable material option for solar panels, recognizes that it is appropriate to reduce the regulatory burden on Solar Panel Vendors that properly recycle their solar panels. However, by choosing not to exclude those solar panels from being classified as hazardous wastes, DTSC has proposed a program that will still impose a substantial regulatory burden on solar panel vendors. The Department should, therefore, include in its proposed regulatory regime established by section 66261.6 an exclusion for properly recycled solar panels from classification as a hazardous waste. In doing so, the Department will create a strong incentive for Solar Panel Vendors that recycle panels in compliance with the requirements of section 66261.6.

The suggested exclusion from classification as a hazardous waste can be qualified in such a way to ensure that panels are still regulated as universal wastes:

- (i) in transport (pursuant to section 66261.6(a)(8)(E) that incorporates universal waste transportation standards); and
- (ii) at reclamation facilities (pursuant to proposed section 66261.6(a)(8)(I), suggested below, which incorporates universal waste destination facilities standard in the same manner that current subpart (8)(E) incorporates universal waste transportation standards).

As a result, while the suggested exclusion will provide an incentive for Solar Panel Vendors to manage their panels under section 66261.6, it will not result in any reduction in the proposed regulation of waste solar panel recycling.

To ensure that the exclusion from the definition of hazardous wastes for recycled solar panels added to § 66261.6(a)(3)(D) does not result in reduced regulatory requirements for solar panel reclamation facilities, a new subsection should be added that requires solar panel reclamation facilities to manage solar panels in compliance with the requirements of Article 6 of Chapter 23, “Standards for Destination Facilities.”

Separately, the second sentence of section 66261.6(a)(3)(D), as currently drafted, is redundant and should be removed. That sentence appears to indicate that subpart (a)(8)(H) is somehow different from subparts (a)(8)(A)-(G). However, every subpart under (a)(8) is prescriptive, so there is no apparent meaning to the second sentence of (a)(3)(D). Not only is the sentence unnecessary, but the use of the word “however” is confusing because it indicates that the sentence somehow qualifies the first sentence. Since the sentence has no independent meaning and could lead the regulated community to believe that it somehow modifies the first sentence of (a)(3)(D), it should be removed.

To exclude properly recycled waste solar panels from classification as hazardous wastes and to avoid the confusion created by the second sentence of subpart (a)(3)(D), *66261.6(a)(3)(D) should be revised to read as follows:*

(D) solar panels destined for reclamation within the United States and its territories in a program administered by a Solar Panel Vendor provided that the conditions in subsection (a)(8) of this section are met. ~~However, such solar panels are subject to regulation as described in subsection (a)(8)(H) of this section upon arrival at a designated facility located in California.~~ solar panels managed pursuant to this provision are not hazardous wastes.

Also, to ensure that reclamation facilities accepting waste solar panel recyclable material are subject to regulation, *§66261(a)(8) should be amended by the addition of a subsection (I) as follows:*

(I) A solar panels reclamation facility shall manage solar panels in compliance with the requirements of Article 6 of Chapter 23 of this division

3. Section 66273.7.1(c)(1)'s Criteria for Defining Waste Solar Panels Should be Revised to take into Account the Continued Functioning of Cracked Panels

As currently written, section 66273.7.1(c)(1)(B) appears to state that solar panels become waste as soon as they crack, regardless of whether or not they retain functionality and remain in service. That breakage provision is too restrictive, appears to violate the statutory definition of “waste” at Health & Safety Code section 25124 and will lead to unintended consequences. “Broken” in the context of when a solar panel becomes a waste can only mean when (i) a solar panel is damaged to the point that the photovoltaic panel cannot operate within an array to generate electricity and (ii) the panel is therefore removed from the array. Solar panels that are cracked, crazed or fractured are generally designed to retain functionality and be left in place by their owners. By seemingly automatically designating “cracked, broken or shattered” panels as wastes DTSC in effect requires that potentially functioning solar panels be removed, and triggers accumulation time-limits and other criteria.

To avoid this unintended result, and to ensure that DTSC does not regulate products that are not yet waste pursuant to Health & Safety Code section 25124, subsection (c)(1) *should be revised to read as follows:*

(c) Generation of waste solar panels.

(1) A used solar panel becomes a waste on the date ~~when the earlier of the following occurs: (A) The owner discards the solar panel; or (B) The solar panel is physically cracked, broken, or shattered, or otherwise removed from service~~ without intent to re-install it.

4. Section 66261.6(a)(8)(B) Should be Revised to Clarify that Broken Solar Panels May be Handled as Recyclable Materials and to Establish Handling Standards for Recycling Broken Panels

As written, section 66261.6(a)(8)(B) states that only “intact” solar panels qualify for management as recyclable materials under § 66261.6. That provision is inconsistent with the definition of “solar panel” contained in section 66261.10, which provides for “broken” panels to be managed as universal waste so long as they can be identified as panels. The intent of the proposed regulations is to encourage the recycling of such universal waste. The limitation on recycling broken panels is further inconsistent with statements made by DTSC staff at the July 28, 2010 workshop that both intact and cracked panels are intended to qualify for management as recyclable materials under § 66261.6.

Requiring generators and transporters to manage the subset of broken panels as universal waste while the rest remain recyclable materials would significantly reduce the feasibility of managing solar panels under section 66261.6, and would result in no added benefits. Intact and cracked panels are equally recyclable, and the structure and inherent stability of solar panels means that cracked and broken panels are no more likely to release hazardous constituents than intact panels. In that respect, solar panels are fundamentally different than CRTs. Cracked CRTs cannot function as designed and are at risk of releasing their constituents. Cracked solar

panels continue to function as designed. Therefore, there is no reason to limit the applicability of section 66261.6 recycling to intact panels and to require that broken panels be treated separately as universal waste.

To clarify that broken panels can be managed under section 66261.6 and to ensure that those panels are managed properly in a way to avoid releases to the environment under reasonably foreseeable conditions, *DTSC should revise section 66261.6(a)(8)(B) to read as follows:*

(B) ~~Only intact solar panels shall be managed.~~ Any solar panel or container of solar panels that shows evidence of leakage or damage that could cause a release of hazardous constituents to the environment shall be managed in accordance with ~~article 8 of chapter 23 of this division.~~ the requirements of section 66273.83.

5. Section 66273.83(a) Should be Amended to Conform the Management of Solar Panel Universal Wastes with Existing Management Standards for Similar Universal Wastes

Subsection (a) of Section 66273.83 specifying how solar panel universal waste is to be managed includes language amalgamated from various sections of Chapter 23 applicable to other classes of universal waste, including provisions of section 66273.33 governing lamps, and provisions of section 66273.33.5 governing CRTs and electronic devices. A number of the provisions applied to solar panels, particularly those governing lamps and CRTs, are designed to prevent the breakage of universal wastes that are far more fragile and prone to releasing hazardous constituents than are end-of-life solar panels.

CRTs, which are easily broken and, when broken, may release lead into the environment are distinctly different than solar panels and, for that matter, electronic devices. Similarly, waste lamps are significantly more fragile and likely to release hazardous constituents into the environment than are solar panels. Solar panels, by comparison, are designed in a robust fashion to operate in and withstand extreme weather conditions for over two decades. They are necessarily much more robust than lamps or CRTs, and as a result are much less prone to breaking or loss of constituents. The hazardous constituents contained in waste solar panels are highly stable, and are unlikely to escape even if the panels are broken. The fact that the panels are far less likely to break than CRTs or lamps, combined with the fact that broken panels are much less likely than broken CRTs or lamps to release hazardous constituents, indicates that the panels should *not* be subject to the same management standards as those governing CRTs or lamps.

Solar panels should, therefore, be subject to management standards substantially equivalent to those governing electronic devices. Like waste solar panels, waste electronic devices are unlikely to break or release hazardous constituents to the environment. Section 66273.83(a) should therefore be revised to include language similar to that utilized by the management standards for electronic devices at section 66273.33.5(a)(1)(B). *Section 66273.83(a) should be revised as follows:*

(a) A handler of universal waste solar panels shall manage the solar panels in a manner that prevents releases of any ~~solar panels hazardous constituents or any hazardous component of a solar panel~~ to the environment under reasonably foreseeable conditions, as follows:

(1) A handler of universal waste solar panels shall contain any solar panel in a ~~container or package that is structurally sound, adequate to prevent breakage manner that prevents release of hazardous constituents to the environment, the solar panel, and compatible with the contents of the solar panel. Such a container or package~~. If a container is used, such a container shall lack evidence of leakage, spillage or damage that could cause leakage prevent the release of hazardous constituents under reasonable foreseeable conditions.

(2) Intact solar panels that are managed in a manner that prevents ~~breakage of the solar panels and~~ release of hazardous constituents ~~components of the solar panels~~ to the environment under reasonably foreseeable conditions (e.g., stretch-film on a pallet) shall be deemed to comply with subsection (a)(1) of this section.

(3) A handler of universal waste solar panels shall immediately clean up and place in a container any solar panel that ~~is broken and shall place in a container any solar panel that shows evidence of breakage, leakage, or damage that could cause the release of solar panel glass or other may be expected to cause a release of hazardous constituents to the environment under reasonably foreseeable conditions. The containers shall be structurally sound, compatible with the contents of the solar panels and shall lack evidence of leakage, spillage or damage that could cause leakage or releases of solar panel glass or other hazardous constituents prevent releases of hazardous constituents~~ to the environment under reasonably foreseeable conditions.

~~(4) A handler of universal waste solar panels shall place solar panels in a container with packing materials, if such material is necessary to prevent breakage during handling, storage and transportation.~~

6. Subsection of 66273.8(c) Should be Deleted to Ensure Reasonable Regulation of Universal Waste Solar Panels

DTSC has proposed eliminating the exemption for Household Universal Waste and Conditionally Exempt Small Quantity Generators of Universal Waste from § 66273.8 for generators of solar panels. The stated intent for this elimination of those general universal waste provisions is to encourage small quantity generators to use trained installers to disassemble solar arrays. In the first instance, there is no reason for DTSC to treat small quantity generators of universal waste solar panels differently from small quantity generators of other universal wastes, because the characteristics of universal waste solar panels are no different from the characteristics of other universal wastes. In many instances, universal waste solar panels are *more* amenable to handling by individuals than other universal wastes. For example, the hazardous constituents in universal waste solar panels are far more stable and less prone to release than the hazardous constituents contained in universal waste CRTs.

Additionally, DTSC's proposal will have many unintended side-effects and will not accomplish DTSC's stated purpose. By removing the requirement, DTSC would subject all household owners and small quantity generators of universal waste solar panels to accumulation time-limit, personnel training, and many other requirements that will not advance the Department's stated goal of ensuring that "only universal waste solar panel handlers manage solar panels."

Further, the structural purpose of both the federal and state-based universal waste regulatory regimes is to transfer the regulatory burden from unsophisticated entities (such as households) to sophisticated entities (such as collection centers). Removing the exemptions would eliminate this key facet of the Universal Waste program.

Section 66273.8(c) should therefore be deleted, as follows:

~~(c) The exemptions provided for in subsections (a) and (b) of this section shall not be applicable to the management of universal waste solar panels.~~

7. Section 66261.6(a)(8)(E) Regarding the Transportation of Recyclable Solar Panels Should be Revised to Ensure that the Small Quantity Exemptions Applicable to the Transportation of Universal Wastes Also Apply to Transportation of Recyclable Materials

Section 66261.6(a)(8)(E) incorporates the transportation requirements of Article 5, governing universal waste transporters and applies them to the transportation of recyclable solar panels. However, it does not explicitly incorporate other provisions of the universal waste regulations that act to limit the scope of Article 5. Specifically, Section 66261.6(a)(8)(E) does not incorporate the exemptions found in section 66273.8 of Chapter 23, which, as revised by the comments proposed in this letter, exempt households and small quantity generators of universal waste solar panels from the transportation requirements of Article 5. To ensure that the scope of Article 5 is the same for transporters of recyclable solar panels under section 66261.6 and Chapter 23, *section 66261.6(a)(8)(E) should be revised to read as follows:*

(E) A transporter of solar panels shall manage solar panels in compliance with the requirements of article 5 of chapter 23 of this division, subject to the exemptions in section 66273.8.

8. Section 66261.6(a)(8)(H) Should be Revised to Clarify the Constituents that Must be Recovered and to Permit Panel Reuse

The phrase “including recovery of hazardous constituents” found in Section 66261.6(a)(8)(H), fails to clarify that the hazardous constituents which must be recovered are those that result in the panels being classified as a hazardous waste under California law. As currently written, section (a)(8)(H) could be misinterpreted to require recovery of any hazardous constituent, even trace constituents, listed in Division 4.5 of Title 22 of the California Code of Regulations, regardless of the relationship between that constituent and the panel’s hazardous waste classification. Section (a)(8)(H) should be revised to clarify that Solar Panel Vendors need only recover the hazardous constituent(s) that resulted in a panel’s classification as a hazardous waste under California law.

Separately, as currently drafted, Solar Panel Vendors may only manage waste solar panels pursuant to section 66261.6(a)(3)(D) if the panels will be recycled by being reclaimed. In other words, the panels may not be reused by being refurbished and put back into service. Limiting applicability of section 66261.6(a)(3)(D) to panels which will be reclaimed will skew incentives for Vendors by incentivizing reclamation at the expense of panel reuse. If panels retain functionality sufficient to warrant reuse and there is a market for their reuse, there is no reason why Solar Panel Vendors should be precluded from refurbishing and reinstalling the panels. Section 66261.69(a)(8)(H) should therefore be revised to allow Solar Panel Vendors to reuse the panels.

To ensure that waste panels managed under section 66261.6 may be recycled by being reused and to make clear that the hazardous constituents that must be recovered are those that cause the panels to be classified as hazardous under these regulations, *section 66261.6(a)(8)(H) should be revised to read as follows:*

(Note. The subsection revised below is relabeled as subsection (H) because it was erroneously labeled as a second subsection (G) in the draft regulations.)

(GH) The solar panels shall be recycled by being reclaimed at the designated facility, including recovery of the hazardous constituents that cause the panels to be classified as a hazardous waste under these regulations, or by being reused as solar panels.

9. DTSC Should Clarify that Removal of Wires and Metal Frames Does not Rise to the Level of “Treatment” of Solar Panels, and therefore does not Require Specific Regulations Allowing for the Conduct of such Activity

The disassembly of a solar panel array, including the removal of wires and metal frames, should not be considered “treatment” by DTSC because until an array is disassembled, solar panels cannot be classified as waste. (By analogy, unplugging a computer and removing it from its docking station is not considered “treatment.”) Therefore, all steps associated with the disassembly of a solar panel array should not be considered treatment of a waste.

Further, simple, discrete activities such as removal of wires or metal frames from waste solar panels should not be considered treatment because such activities involve the reclamation of usable products from the waste solar panel and not the treatment of a hazardous waste to alter its characteristics.

Insofar as the Department determines that the removal of wires and/or metal frames *does* rise to the level of treatment, it should insert a provision into § 66273.83 as new subpart (d) allowing handlers, transporters, and collection facilities to remove wires and metal frames from solar panels. This new subsection (d) should be similar in structure and function to the treatment standards for batteries found at § 66273.33(a)(2), and *should read as follows*:

(d) A universal waste solar panel handler, transporter, or collection facility may conduct the following activities:

(1) Removing wires from solar panels;

(2) Removing metal frames from solar panels; or

(3) Disassembling solar panels into individual components, modules or cells.

Additionally it would be highly beneficial to the nascent solar panel industry for the Department to adopt regulations, similar to those found at § 66273.71 - 73 governing printed circuit boards, that will allow solar panel handlers, transporters, and/or collection facilities to shred solar panels prior to their arrival at destination facilities. Allowing those entities to shred panels prior to their transportation to destination facilities will lower the cost of recycling, which will in turn encourage more generators to recycle the panels.

10. Section 66261.6(a)(8)(F) Should be Revised to Allow for Efficient Management and Transportation of Waste Solar Panels

Section 66261.6(a)(8)(F) requires transporters of waste solar panels to deliver the panels to reclamation facilities. While that provision is intended to ensure that solar panels will be recycled in the United States at a reclamation facility chosen by the Solar Panel Vendor, the fact that transporters would not be allowed to take the panels to aggregation points prior to delivering them to reclamation facilities will lead to highly inefficient recycling programs that are financially burdensome.

For example, under Section 66261.6(a)(8)(F) as currently proposed if an twenty panel array on a residential rooftop in California reaches end-of-life and the Vendor plans to send the

panels to a reclamation facility in Massachusetts, the Vendor cannot first have the panels transported to a nearby collection facility to be aggregated with other small quantities of waste solar panels. Instead, the twenty panels must be sent immediately to the reclamation facility in Massachusetts, despite the fact that twenty panels will fill up only a fraction of a truck or shipping container. A recycling program operated in such a manner will be significantly more expensive than one in which small quantities of waste may be aggregated prior to long-distance transportation.

The requirement under Section 66261.6(a)(8)(F), that prevent a transporter of recyclable solar panels from taking the panels to an aggregation point, will result in recyclable solar panels being handled as universal wastes. This is because a entity managing panels designated as universal wastes may accept panels from offsite and hold them for a year prior to transporting them to a destination facility, thereby allowing for aggregation and cost-effective recycling.

To allow Vendors to aggregate recyclable solar panels prior to sending them to reclamation facilities for recycling , and to ensure that reclamation facilities are in the United States, *section 66261.6(a)(8)(F) should therefore be revised to read as follows:*

~~(F) A transporter of solar panels shall not deliver s~~ Solar panels managed under this section must be delivered within one year after the solar panels become waste to a place other than to a reclamation facility within the United States and its territories that is designated by the Solar Panel Vendor. who is administering the solar panel reclamation program

11. Proposed Chapter 23, Article 8 Standards should be Integrated into Existing Chapter 23 Standards

DTSC recently finished streamlining and consolidating existing universal waste regulations by removing duplicitous provisions of from the C.C.R. Since the proposed solar panel regulations are nearly identical to existing Chapter 23 standards in most respects, there is no reason to begin the duplication process anew by adding a new article to the standards. Further, there is no apparent reason why separation of solar panel regulations into a new article would benefit DTSC or the regulated community. Article 8 should therefore be integrated into existing chapter 23 standards.

12. Section 66261.6(a)(8)(A) and (D) should be Revised to Avoid Confusion and Duplication of Requirements found in Subparts (8)(A) and in (8)(H)

Section 66261.6(a)(8)(A), as currently proposed, may lead people to believe that they cannot place solar panels on the ground at any point during solar panel array dismantling. The intent of (a)(8)(A) is that no hazardous materials enter the environment. That provision should be rewritten to achieve more directly that objective. Rewriting the section will ensure that the hazardous constituents of solar panels are not released into the environment. Because sections (a)(8)(F) and (H) currently ensure that entire solar panels are not disposed of into the environment by requiring that the panels be recycled at a reclamation facility, there is no need for that section (a)(8)(A) to duplicate that protection with respect to entire solar panels.

Similarly, Section 66261.6(a)(8)(D), as currently proposed, is somewhat unclear. It may lead Vendors to believe that they cannot place solar panels on the ground at any point during array dismantling. The intent of (a)(8)(D) appears to be to ensure that no hazardous constituents enter the environment. The provision should be rewritten to achieve that objective more directly.

To tailor section (a)(8)(A) and (D) more directly to the objective of preventing the release of hazardous constituents to the environment and to avoid confusion over the proper handling of entire solar panels during solar panel array dismantling, *the sections should be revised to read as follows:*

(8)(A) Solar panels shall be managed in a manner that prevents releases of ~~any solar panels or any hazardous component of~~ constituent from a waste solar panel to the environment under reasonably foreseeable conditions pursuant to the requirements of this section.

...

(D) Any ~~spills or~~ releases of any hazardous constituent from a solar panel ~~or components thereof~~ shall be cleaned up immediately.

13. Comment Proposing Revision of § 66261.6(a)(8)(C) to Ensure that Waste Solar Panels are Not Confused with “Scrap Metals” or “CRTs”

The purpose of proposed section 66261.6(a)(8)(C) is to ensure that waste solar panels are not mistaken for waste CRTs or waste scrap metal. As currently written, a Vendor labeling solar panels under section 66261.6(a)(8)(C) must label waste solar panels either as “Solar Panels not Scrap Metal” or as “Solar Panels not CRTs.” To ensure that waste solar panels are not mistaken for either, section 66261.6(a)(8)(C) should have a label which reads “Solar Panels, Not Scrap Metal or CRT Glass.” *The section should therefore be revised as follows:*

(C) A solar panel or container of solar panels shall be labeled with ~~one of~~ the following phrases: “Solar Panels, Not Scrap Metal”, or “~~Solar Panels Not CRT Glass~~”.

14. The Export Standard in Section § 66261.6(a)(8)(G) Should be Revised to Ensure that Universal Waste Export Requirements Apply to Waste Solar Panels

Section 66261.6(a)(8)(G) requires that waste solar panels managed as recyclable materials pursuant to section 66261.6(a) will be exported as hazardous wastes. By comparison, solar panels handled as universal wastes that will be exported must be handled *either* as universal wastes in accordance with Article 4 of Chapter 23 or as hazardous wastes. Given that section 66261.6 is meant to incentivize recycling by creating an appropriate regulatory framework, it is counterproductive to describe export standards for recyclable materials under that provision as different than export standards for universal wastes.

To ensure that waste panels managed as recyclable materials under section 66261.6 are subject to export standards that are the same as those governing universal waste solar panels, *section 66261.6 should be revised to read as follows:*

(G) A person is prohibited from exporting solar panels unless export is conducted in accordance with applicable export requirements for ~~hazardous~~ universal waste as described in ~~chapter 12~~ Article 4 of Chapter 23 of this division.

15. A Subsection Should be Added to Section 66273.7.1(b) to Ensure that the Proposed Regulatory Scheme does not Unintentionally Suppress the Market for Second-hand Panels

As currently written, the applicability standards of section 66273.7.1 do not allow for panels previously designated as wastes that are subsequently refurbished or otherwise reinstalled to shed their classification as wastes. It appears that section 66273.7.1 was modeled, at least in part, on the applicability standards governing universal waste electronic devices (section 66273.3). Those standards already contain a provision (at 66273.3(b)(6)) which allows for electronic device wastes that are refurbished or otherwise reinstalled to shed their classification as wastes. DTSC should add a provision identical to that governing electronic device wastes to the applicability standards governing solar panels. In doing so, DTSC will ensure that it does not unintentionally suppress the market for second-hand or refurbished panels by inappropriately designating them as wastes. *DTSC should therefore revise section 66273.7.1 to read as follows:*

(b) Solar panels not covered pursuant to this chapter. The requirements of this chapter do not apply to the following solar panels:

...

(6) Solar panels that were previously identified as wastes, but are no longer identified as wastes (e.g., a discarded solar panel that is refurbished and is returned to service).

16. There is no need to Require Additional Annual Reporting or other Notification Requirements for Entities Generating or Managing Waste Solar Panels

The requirements currently established for solar panel transporters, departmental notification, and annual reporting are sufficient and need not be augmented.

With regard to transportation requirements, current universal waste transporter requirements are sufficient to ensure safe transportation of universal waste solar panels. The current standards governing universal waste transporters, as augmented by applicable federal DOT standards, are presently deemed sufficient enough to protect the public during transportation of universal waste. There is no reason to believe that the transportation of solar panels is any more risky -- and ample evidence of the stability of hazardous materials in solar panels which would indicate that they are less risky -- than other classes of universal wastes. Applying Article 5 of Chapter 23 to the transportation of solar panels managed under section

66261.6 is therefore more than sufficient.

Annual reports are unnecessary and burdensome. DTSC does not currently require all categories of universal waste to submit annual reports, reserving that requirement for a small subset of universal wastes. Given that management under section 66261.6 is meant to encourage recycling, it would be counterintuitive to reduce the effectiveness of the program by increasing the regulatory burden on Vendors by requiring annual reports.

With regards to notification requirements under section 66261.6, DTSC should obtain enough information to allow it to identify and contact Solar Panel Vendors. To ensure that this information remains current, Solar Panel Vendors should be required to update the information within a reasonable amount of time after the information changes. A provision analogous to the 5000 kg Department notification threshold contained in the Universal Waste Rule is not necessary, and would be overly burdensome. The information requirements should not be overly burdensome.

17. Replace the Term “Panel” with “Module” To Reflect the Standard Use in the Solar Industry

In the solar industry, the term “module” is generally used in describing photovoltaic technologies and equipment while the term “panel” is more generally used to describe solar thermal technologies and equipment. As currently drafted, solar thermal technologies are not included within the existing definition of “Solar panel.” As a result, it is recommended that the term “module” replace “panel” where used in the regulation.


18. Clarification Regarding Solar Thermal Technologies

Solar thermal technologies use the sun to provide thermal energy for solar water heating, solar pool heating, solar space heating and cooling, and industrial process pre-heating. Solar thermal technologies produce heat while photovoltaic technologies produce electricity. Because of the significant metals composition of most solar thermal equipment, we expect that solar thermal equipment would be covered under the existing recycled scrap metal exemption.

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The California Solar Energy Industries Association, Solar Alliance and the Solar Energy Industries Association appreciate this opportunity to submit comments on the DTSC's proposed regulations on the management of waste solar panels.

Respectfully submitted,



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DO NOT CITE: Prepared as Attachment to Comments on DTSC Workshop Regulations

Proposed Standards for Management of Waste Solar Panels
Department Reference Number: R-2010-01

Legend: Changes are shown from the existing text of the California Code of Regulations, title 22, as:

Underline	<u>underline</u>	Additions to existing text
Strikeout	strikeout	Deletions to existing text

For the convenience of the reader, existing text is shown as plain text and text deleted from existing text is shown as strikeout (~~strikeout~~). Added text is shown as underline (underline).

This document proposes regulatory amendments that provide for the appropriate regulation of waste solar panels that are currently regulated by the Department. ~~presents two, proposed (new) options for the management of hazardous waste solar panels at end-of-life. Both options are not mutually-exclusive, but are presented together so that a regulatory entity has a choice of management schemes. Absent these two regulatory conditional exemptions, hazardous waste solar panels must be managed under full hazardous waste regulations, which are California's current standards. Thus, as drafted, there would be three (3) options for management of hazardous waste solar panels:~~ It proposes regulations that classify waste solar panels as universal wastes and waste solar panels will be regulated under that statutory scheme. The proposal creates an additional regulatory option for those panels that will be managed as recyclable materials. When recycled as "recyclable materials," those panels will be subject only to the requirements of section 66261.6(a)(8)(A)-(I) governing recyclable materials and to the standards incorporated therein. Note that pursuant to the universal waste standards set forth in existing regulations, universal wastes destined for disposal must be handled as hazardous wastes.

1. ~~Full hazardous waste regulations (current standard)~~
2. ~~Conditional hazardous waste exemption (proposed)~~
3. ~~Universal waste management (proposed)~~

~~It is also important to note that once a regulatory scheme is chosen for the management of a particular hazardous waste solar panel, that scheme must be followed or that waste may no longer be subject to that particular exemption.~~

§ 66260.10. Definitions.

When used in this division, the following terms have the meanings given below:

“Soil-pore liquid” means the liquid contained in openings between particles of soil in the unsaturated zone.

"Solar panel" means any photovoltaic module, photovoltaic panel, or other photovoltaic device that collects energy from the sun for the purpose of converting light into electricity for general electricity grid use. "Solar panels" does not include physically damaged, deteriorated, or altered solar panels (or components thereof), that are no longer recognizable as intact or broken solar panels, nor does it include solar powered electronic devices that have solar cells incorporated into their structures.

"Solar Panel Vendor" means the manufacturer, producer, marketer or distributor of solar panels located within the United States and its territories, or a third-party entity acting on behalf of such manufacturer, producer, marketer or distributor, who administers a solar panel reclamation program and who accepts (for reclamation) one or more solar panels that are subject to the conditions for the exemption in section 66261.6 of chapter 11 of this division.

“Solid Waste Management Unit” means any unit at a hazardous waste facility from which hazardous constituents might migrate, irrespective of whether the units were intended for the management of wastes, including but not limited to: containers, tanks, surface impoundments, waste piles, land treatment units, landfills, incinerators and underground injection wells.

66261.6. Requirements for Recyclable Materials.

(a)(1) Recyclable materials are subject to the applicable requirements for generators, transporters and facilities of articles 1 and 2 of chapter 16 of this division, except as specified otherwise for the materials listed in subsections (a)(2), (a)(3), (a)(4), (a)(5), and (a)(6) of this section.

(2) The following recyclable materials are also regulated under the articles (of chapter 16 of this division) specified below, and all applicable provisions in chapters 20 and 21 of this division:

(A) [RESERVED];

(B) hazardous wastes burned for energy recovery in boilers and industrial furnaces that are not regulated under article 15 of chapter 14 or 15 of this division are regulated under article 8 of chapter 16 of this division.

(C) spent lead-acid storage batteries that are being reclaimed are regulated under article 7 of chapter 16 of this division;

(D) recyclable materials that are being used in agriculture are regulated under article 8.5 of chapter 16 of this division;

(E) waste elemental mercury that is being recycled is regulated under article 9 of chapter 16 of this division.

(3) The following are not subject to regulation under this division, and are not subject to the notification requirements of Health and Safety Code section 25153.6:

(A) materials that can be shown to be recycled by methods identified in subdivisions (b), (c) or (d) of Health and Safety Code section 25143.2; and

(B) scrap metal as defined in section 66260.10. However, scrap metal that meets the definition of a RCRA hazardous waste is not subject to regulation under this division and is not subject to the notification requirements of Health and Safety Code section 25153.6, only when the scrap metal is being recycled; and

(C) hazardous wastes that exhibit the characteristic of toxicity specified in section 66261.24(a)(1) and do not exhibit any other characteristic of a hazardous waste specified in article 3 of this chapter (commencing with section 66261.20), are not listed in article 4 of this chapter (commencing with section 66261.30), and that qualify as one of the materials specified in 40 CFR section 261.6(a)(3) (incorporated by reference in section 66260.11).

(D) solar panels destined for reclamation within the United States and its territories in a program administered by a Solar Panel Vendor provided that the conditions in subsection (a)(8) of this section are met. ~~However, such solar panels are subject to regulation as described in subsection (a)(8)(H) of this section upon arrival at a designated facility located in California.~~ solar panels managed pursuant to this provision are not hazardous wastes.

(4) The following are prohibited as specified:

(A) the use of material (e.g., waste, used oil or other material) which is contaminated with dioxin or any other hazardous waste (other than a waste identified solely on the basis of ignitability), for dust suppression or road treatment is prohibited;

(B) the use of used oil as a road oil, dust suppressant or weed control agent is prohibited, except as provided otherwise in Health and Safety Code section 25250.5.

(5) The following hazardous waste, when recycled, is exempt from the restrictions concerning the materials used in a manner constituting disposal or used to

produce products that are applied to the land, as provided in Section 25143.2(e) of the Health and Safety Code.

(A) Spent catalyst generated from the Fluid Catalytic cracking (FCC) unit in a petroleum refinery when it is recycled at portland cement kilns as the substitute of alumina and silica in the kiln feed. The concentration of the extractable heavy metals in the FCC catalyst shall not exceed the values given in Table I-C CCWE, Section 66268.106(a) except for nickel and vanadium. The total concentration of nickel and vanadium in the FCC catalyst shall not exceed 3,000 mg/kg, combined.

(6) Hazardous wastes that meet all the following criteria are not subject to regulation under this division but, instead, are subject to regulation as specified in 40 CFR section 261.6(a)(2) (incorporated by reference in section 66260.11):

(A) the hazardous waste exhibits the characteristic of a hazardous waste specified in section 66261.24(a)(1);

(B) the hazardous waste does not exhibit any other characteristic of a hazardous waste specified in article 3 of this chapter (commencing with section 66261.20);

(C) the hazardous waste is not listed in article 4 of this chapter (commencing with section 66261.30);

(D) the hazardous waste is not listed in article 4.1 of this chapter (commencing with section 66261.50); and

(E) the hazardous waste qualifies for regulation pursuant to 40 CFR section 261.6(a)(2) (incorporated by reference in section 66260.11).

(7) Hazardous waste that is exported to or imported from designated member countries of the Organization for Economic Cooperation and Development (OECD) (as defined in 40 CFR section 262.58(a)(1) or section 66262.58(a)(1)) for purpose of recovery is subject to the requirements of 40 CFR Part 262, Subpart H or this article, if it is subject to either the Federal manifesting requirements of 40 CFR Part 262, or to the universal waste management standards of 40 CFR Part 273.

(8)(A) Solar panels shall be managed in a manner that prevents releases of ~~any solar panels or any hazardous component of constituent from a waste solar panel~~ to the environment under reasonably foreseeable conditions pursuant to the requirements of this section.

~~(B) Only intact solar panels shall be managed.~~ Any solar panel or container of solar panels that shows evidence of ~~leakage or~~ damage that could cause a release of hazardous constituents to the environment shall be managed in accordance with ~~article 8 of chapter 23 of this division.~~ the requirements of section 66273.83.

(C) A solar panel or container of solar panels shall be labeled with ~~one of the following phrases: "Solar Panels, Not Scrap Metal", or "Solar Panels Not CRT Glass".~~

(D) Any ~~spills or~~ releases of any hazardous constituent from a solar panel or components thereof shall be cleaned up immediately.

(E) A transporter of solar panels shall manage solar panels in compliance with the requirements of article 5 of chapter 23 of this division, subject to the exemptions in section 66273.8.

~~(F) A transporter of solar panels shall not deliver s~~ Solar panels managed under this section must be delivered within one year after the solar panels become waste to a place other than to a reclamation facility within the United States and its territories that is designated by the Solar Panel Vendor. ~~who is administering the solar panel~~

~~reclamation program~~

(G) A person is prohibited from exporting solar panels unless export is conducted in accordance with applicable export requirements for ~~hazardous-universal~~ waste as described in ~~chapter 12~~ Article 4 of Chapter 23 of this division.

~~(G-H)~~ (H) The solar panels shall be recycled by being reclaimed at the designated facility, including recovery of the hazardous constituents that cause the panels to be classified as a hazardous waste under these regulations, or by being reused as solar panels.

(I) A solar panels reclamation facility shall manage solar panels in compliance with the requirements of Article 6 of Chapter 23 of this division

(b) Owners and operators of facilities that store recyclable materials before they are recycled are regulated under all applicable provisions of articles 1 through 12, 27, 28, and 28.5 of chapters 14 and 15 and any applicable provisions of chapters 16, 18, and 20 and the notification requirements under section 3010 of RCRA, except as provided in subsection (a) of this section.

(c) Owners or operators of facilities subject to RCRA permitting requirements with hazardous waste management units that recycle hazardous wastes are subject to the requirements of articles 27 and 28 of chapters 14 or 15.

§66261.9. Requirements for Universal Waste.

(a) The hazardous wastes listed in this section are exempt from the management requirements of chapter 6.5 of division 20 of the Health and Safety Code and its implementing regulations except as specified in chapter 23 and, therefore, are not fully regulated as hazardous wastes. The wastes listed in this section are subject to regulation pursuant to chapter 23 and shall be known as “universal wastes.”

- (1) Batteries, as described in section 66273.2, subsection (a);
 - (2) Electronic devices, as described in section 66273.3, subsection (a);
 - (3) Mercury-containing equipment, as described in section 66273.4, subsection (a);
 - (4) Lamps, as described in section 66273.5, subsection (a) (including, but not limited to, M003 wastes);
 - (5) Cathode ray tubes, as described in section 66273.6, subsection (a);
 - (6) Cathode ray tube glass, as described in section 66273.7, subsection (a);
 - (7) Aerosol cans, as specified in Health and Safety Code section 25201.16; and
 - (8) Solar panels, as described in section 66273.7.1, subsection (a).
- (b) Unless specified otherwise in section 66273.60, universal wastes shall be managed as hazardous wastes pursuant to chapters 10 through 16, 18, and 20 through 22 of this division upon arrival at a destination facility.

Chapter 23. Standards for Universal Waste Management

Article 1. General

§66273.1. Scope.

(a) This chapter establishes requirements for managing universal wastes, as defined in section 66273.9. The following universal wastes are subject to regulation pursuant to this chapter:

- (1) Batteries, as described in section 66273.2, subsection (a);
- (2) Electronic devices, as described in section 66273.3, subsection (a);
- (3) Mercury-containing equipment, as described in section 66273.4, subsection (a);
- (4) Lamps, as described in section 66273.5, subsection (a) (including, but not limited to, M003 wastes);
- (5) Cathode ray tubes, as described in section 66273.6, subsection (a);
- (6) Cathode ray tube glass, as described in section 66273.7, subsection (a);
- (7) Aerosol cans, as specified in Health and Safety Code section 25201.16; and
- (8) Solar panels, as described in section 66273.7.1, subsection (a).

(b) This chapter provides an alternative set of management standards in lieu of regulation as hazardous wastes pursuant to chapters 10 through 16, 18, and 20 through 22 of this division. The alternative management standards of articles 1 through 3 of this chapter do not apply to destination facilities, as defined in section 66273.9, except as otherwise specified in section 66273.60, subsections (b) or (c).

§66273.7.1. Applicability—Solar Panels.

(a) Solar panels covered pursuant to chapter 23. The requirements of this article apply to solar panels, as defined in section 66273.9, except those listed in subsection (b) of this section.

(b) Solar panels not covered pursuant to this chapter. The requirements of this chapter do not apply to the following solar panels:

(1) Solar panels that are not yet wastes pursuant to chapter 11 as provided in subsection (c) of this section;

(2) Solar panels that do not exhibit a characteristic of a hazardous waste as set forth in article 3 of chapter 11 of this division;

(3) Solar panels that are destined for recycling (or are recycled) by being “used in a manner constituting disposal,” as described in section 66266.20, or that are destined for disposal (or are disposed) to a class I landfill. Such solar panels shall be managed as hazardous wastes pursuant to chapters 10 through 16, 18, and 20 through 22 of this division;

(4) Solar panels that are managed as hazardous wastes pursuant to chapters 10 through 16, 18, and 20 through 22 of this division;

(5) Solar panels managed pursuant to section 66261.6(a)(3)(D).

(6) Solar panels that were previously identified as wastes, but are no longer identified as wastes (e.g., a discarded solar panel that is refurbished and is returned to service).

(c) Generation of waste solar panels.

(1) A used solar panel becomes a waste on the date ~~when the earlier of the following occurs: (A) The owner discards the solar panel ; or (B) The solar panel is physically cracked, broken, or shattered, or otherwise removed from service without intent to re-install it.~~

(2) Unused solar panels.

(A) An unused solar panel that is not a retrograde material becomes a waste on the date it is discarded (e.g., when stored prior to being sent for reclamation).

(B) An unused solar panel that is a retrograde material becomes a waste on the date that it becomes a recyclable material pursuant to subsection (e) of the definition of “recyclable materials” in section 66260.10.

§66273.8. Exemptions.

(a) Household universal waste generator exemption.

A person who maintains a household, as defined in section 66273.9, and who produces universal waste derived from that household, is a generator, as defined in section 66273.9, of household universal waste. Such a generator is exempt from the requirements of this chapter applicable to a universal waste handler, as defined in section 66273.9, with respect to the management of that generator's household universal waste, provided that:

(1) The generator does not dispose of the universal waste;

(2) The universal waste is relinquished to another universal waste handler, a universal waste transporter (e.g., for curbside collection), a destination facility, or an authorized curbside household hazardous waste collection program;

(3) The generator does not treat the universal waste, except as follows:

(A) The generator treats the universal waste pursuant to one or more of the following provisions of this chapter and complies with subsection (a)(3)(B) of this section:

1. Section 66273.33, subsections (a)(2), (b)(3), (c)(5)(C)1.a., and/or (c)(7) as referenced in section 66273.33, subsections (c)(4)(B)2., (c)(5)(B)2.b., and/or (c)(5)(C)4.b.; and/or

2. Sections: 66273.71, subsection (b); 66273.72, subsections (b)(1), (c)(1), (d)(1), and/or (e)(1).

(B) The generator ensures that all materials produced from treating the universal waste are properly classified and managed in accordance with any applicable requirements of this division.

(b) Conditionally exempt small quantity universal waste generator exemption.

A conditionally exempt small quantity universal waste generator, as defined in section 66273.9, is exempt from the requirements of this chapter applicable to a universal waste handler, as defined in section 66273.9, with respect to the management of that generator's universal waste, provided the conditions set forth in subsections (a)(1) through (a)(3) of this section are met.

~~(c) The exemptions provided for in subsections (a) and (b) of this section shall not be applicable to the management of universal waste solar panels.~~

§66273.9. Definitions.

When used in this chapter, the terms listed in this section have the meanings given below. Unless otherwise specified, listed terms that cross-reference the definitions of other listed terms refer to the definitions set forth in this section for those other terms. Terms that are also defined in chapter 10 of this division are duplicated here solely for convenience of the regulated community. Terms used in this chapter that are not defined in this section but are defined in chapter 10 of this division and/or chapter 6.5 of division 20 of the Health and Safety Code have the meanings given in those sources.

“Ampule” means an airtight vial made of glass, plastic, metal, or any combination of these materials.

“Battery” means a device consisting of one or more electrically connected electrochemical cells that is designed to receive, store, and deliver electric energy. An electrochemical cell is a system consisting of an anode, a cathode, and an electrolyte, plus such connections (electrical and mechanical) as may be needed to allow the cell to deliver or receive electrical energy. The term battery also includes an intact, unbroken battery from which the electrolyte has been removed.

“Cathode ray tube” means a vacuum tube or picture tube used to convert an electrical signal into a visual image.

“CESQUWG” see “Conditionally exempt small quantity universal waste generator.”

“Closure” means the act of closing a universal waste handler’s facility pursuant to the requirements of article 7 of this chapter.

“Conditionally exempt small quantity universal waste generator” means a generator of universal waste who:

(a) generates no more than 100 kilograms (220 pounds) of RCRA hazardous wastes, including universal wastes that are RCRA hazardous wastes, and no more than 1 kilogram (2.2 pounds) of acutely hazardous waste in any calendar month; and

(b) remains in compliance with 40 CFR section 261.5.

“CRT” see “Cathode ray tube.”

“CRT glass” means any glass released or derived from the treatment or breakage of one or more CRTs or CRT devices and subsequently reclaimed at a CRT glass manufacturer, or a primary or secondary lead smelter.

“Current closure cost estimate” means the most recent of the estimates prepared in accordance with article 7 of this chapter.

“Dental amalgam” means dental amalgam chunks, dental amalgam fines, mixtures containing dental amalgam fines, single-use dental amalgam traps that contain dental amalgam, dental amalgam sludge, vacuum pump filters that contain dental amalgam, and extracted teeth with amalgam restorations.

“Destination facility” means a facility that treats, disposes of, or recycles a particular category of universal waste pursuant to section 66273.60. A facility at which a particular category of universal waste is only accumulated is not a destination facility for purposes of managing that category of universal waste.

“Dilators and weighted tubing” means mercury-containing dilators and weighted tubing used in medical procedures. “Dilators and weighted tubing” include, but are not limited to, bougie tubes, Canter tubes, and Miller-Abbot tubes.

“Electronic device” means any electronic device that is identified as hazardous waste because it either exhibits the characteristic of toxicity as specified in article 3 of chapter 11 of this division, and/or is a listed hazardous waste as specified in article 4.1 of chapter 11 of this division. Examples of electronic devices include: computer monitors, televisions, cash registers and oscilloscopes (CRT devices), computers, computer peripherals, telephones, answering machines, radios, stereo equipment, tape players/recorders, phonographs, video cassette players/recorders, compact disc players/recorders, calculators, and some appliances. Electronic device does not mean a major appliance, as defined in Public Resources Code section 42166, or other devices which are comprised largely of metals, qualify as “scrap metal” as defined in section 66260.10, and are recycled.

“Flame sensor” means a device, usually found in a gas-fired appliance, that uses the expansion and contraction of liquid mercury contained in a probe to open and shut a valve.

“Foreign Destination” means the ultimate recycling, treatment or disposal facility in a receiving country to which universal waste will be sent.

“Gas flow regulator” means a piece of mercury-containing equipment used to regulate the flow of gas through a gas meter.

“Gauge” see “Pressure or vacuum gauge.”

“Generator” means:

(a) Any person, by site, whose act or process produces hazardous waste identified or listed in chapter 11 of this division or whose act first causes a hazardous waste to become subject to regulation.

(b) Any person, by site, whose act or process produces universal waste or whose act first causes a universal waste to become subject to regulation.

“Handler of universal waste” see “Universal waste handler.”

“Household” means a single detached residence or a single unit of a multiple residence unit and all appurtenant structures. For the purposes of this section, household does not mean a hotel, motel, bunkhouse, ranger station, crew quarters, campground, picnic ground, or day-use recreation facility.

“Lamp” means the bulb or tube portion of an electric lighting device. A lamp is specifically designed to produce radiant energy, most often in the ultraviolet, visible, and infra-red regions of the electromagnetic spectrum. Examples of common lamps include, but are not limited to, fluorescent, high intensity discharge, neon, mercury vapor, high pressure sodium, and metal halide lamps.

“Management” means the handling, storage, transportation, processing, treatment, recovery, recycling, transfer and disposal of hazardous waste (including universal waste).

“Mercury-added lamp” means a lamp to which elemental mercury has been added as an essential part of the manufacturing process used to create that lamp. Examples of common mercury-added lamps include, but are not limited to, fluorescent lamps and mercury vapor lamps.

“Mercury-added novelty” means a mercury-added product intended mainly for personal or household enjoyment or adornment. A “mercury-added novelty” includes, but is not limited to, any item intended for use as a practical joke, figurine, adornment, toy, game, card, ornament, yard statue or figure, candle, jewelry, holiday decoration,

and item of apparel, including footwear.

"Mercury-containing equipment" means a thermostat, mercury switch, thermometer, dental amalgam, pressure or vacuum gauge, mercury-added novelty, mercury counterweight and damper, dilator and weighted tubing, mercury-containing rubber flooring, and gas flow regulator.

"Mercury-containing motor vehicle light switch" means any light switch found in the hood or in the trunk lid of a motor vehicle, if the light switch contains mercury.

"Mercury-containing motor vehicle switch" means any motor vehicle switch that contains mercury including, but not limited to, a mercury-containing motor vehicle light switch.

"Mercury-containing rubber flooring" means any rubber flooring material formulated with intentionally added mercury.

"Mercury counterweights and dampers" means enclosed devices that use liquid mercury for weight or dampening; "mercury counterweights and dampers" includes, but is not limited to, a mercury bow stabilizer used in archery, a mercury recoil suppressor used in shooting, and a mercury counterweight used in a clock.

"Mercury gas flow regulator" see "Gas flow regulator."

"Mercury switch" means an electrical switch that employs mercury to make an electrical contact. "Mercury switch" includes, but is not limited to, the following mercury-containing switches: mercury-containing motor vehicle switches, tilt switches, vibration-sensing switches, off-balance switches, float switches, silent light switches, and relays.

"Mercury thermometer" see "Thermometer."

"Non-automotive mercury switch" means any mercury switch other than a mercury-containing motor vehicle switch.

"Onsite" means the same or geographically contiguous property which may be divided by public or private right-of-way, provided that the entrance and exit between the properties is at a cross-roads intersection, and access is by crossing as opposed to going along the right-of-way. Non-contiguous properties owned by the same person but connected by a right-of-way which the person controls and to which the public does not have access, are also considered onsite property.

"Pressure or vacuum gauge" means any device in which pressure or vacuum is measured using the height of a column of liquid mercury. "Pressure or vacuum gauge" includes, but is not limited to, barometers, manometers, and sphygmomanometers.

"Producer" see "Generator."

"Scrap metal" means (a) any one or more of the following, except as provided in subsection (b) of this section:

- (1) manufactured, solid metal objects and products;
- (2) metal workings, including cuttings, trimmings, stampings, grindings, shavings and sandings;
- (3) solid metal residues of metal production; or
- (4) printed circuit boards that are recycled [except for printed circuit boards referenced in subsec. (b)(7) of this section].

(b) "Scrap metal" excludes all of the following:

- (1) lead-acid storage batteries, waste elemental mercury, and water-reactive metals such as sodium, potassium and lithium;
- (2) magnesium borings, trimmings, grindings, shavings and sandings and any

other forms capable of producing independent combustion;

(3) beryllium borings, trimmings, grindings, shavings, sandings and any other forms capable of producing adverse health effects or environmental harm in the opinion of the Department;

(4) any metal contaminated with a hazardous waste, such that the contaminated metal exhibits any characteristic of a hazardous waste under article 3 of chapter 11 of this division;

(5) any metal contaminated with an oil that is a hazardous waste and that is free-flowing;

(6) sludges, fine powders, semi-solids and liquid solutions that are hazardous wastes; and

(7) any printed circuit board that has been removed from a universal waste electronic device by a universal waste handler as a result of the handler's conduct of activities authorized by sections 66273.71, 66273.72, and/or 66273.73 of chapter 23 of this division and is subject to management as a hazardous waste pursuant to sections 66273.71, 66273.72 and/or 66273.73.

"Solar panel" means any photovoltaic module, photovoltaic panel, or other photovoltaic device that collects energy from the sun for the purpose of converting light into electricity for general electricity grid use. "Solar panels" does not include physically damaged, deteriorated, or altered solar panels (or components thereof), that are no longer recognizable as intact or broken solar panels, nor does it include solar powered electronic devices that have solar cells incorporated into their structures.

"Thermometer" means any thermometer that uses the expansion and contraction of a column of mercury to measure temperature.

"Thermostat" means a temperature control device that contains metallic mercury in an ampule attached to a bimetal sensing element, and mercury-containing ampules that have been removed from these temperature control devices in compliance with the requirements of section 66273.33(c)(5).

"Treatment" or "treat" or "treating" means any method, technique, or process which changes or is designed to change the physical, chemical, or biological character or composition of any hazardous waste or any material contained therein, or removes or reduces its harmful properties or characteristics for any purpose including, but not limited to, energy recovery, material recovery or reduction in volume.

"Universal waste" means any of the wastes that are listed in section 66261.9.

"Universal waste dental amalgam" see "Dental amalgam."

"Universal waste dilators and weighted tubing" see "Dilators and weighted tubing."

"Universal waste gas flow regulator" see "Gas flow regulator."

"Universal waste gauge" see "Pressure or vacuum gauge."

"Universal waste handler":

(a) Means:

(1) A generator (as defined in section 66260.10 and this section) of universal waste; or

(2) The owner or operator of a facility, including all contiguous property, that receives universal waste from other universal waste handlers, accumulates universal waste, and sends universal waste to another universal waste handler, to a destination

facility, or to a foreign destination; or

(3) The owner or operator of a facility who is authorized to treat universal waste pursuant to article 7 of this chapter.

(b) Does not mean:

(1) A person who treats or recycles (except as allowed/authorized in this chapter), or disposes of, universal waste; or

(2) A person engaged in the offsite transportation of universal waste by air, rail, highway, or water, including a universal waste transfer facility; or

(3) The owner or operator of a destination facility.

“Universal waste lamp” see “Lamp.”

“Universal waste mercury counterweights and dampers” see “Mercury counterweights and dampers.”

“Universal waste mercury switch” see “Mercury switch.”

“Universal waste rubber flooring” see “Mercury-containing rubber flooring.”

“Universal waste thermometer” see “Thermometer.”

“Universal waste transfer facility” means any transportation-related facility including loading docks, parking areas, storage areas and other similar areas where shipments of universal waste are held during the normal course of transportation for ten days or less.

“Universal waste transporter” means a person engaged in the offsite transportation of universal waste by air, rail, highway, or water.

“Universal waste treatment unit” means a contiguous area of a universal waste handler’s facility on or in which universal waste is managed pursuant to section 66273.73, subsection (a)(2) or section 66273.73, subsection (b). Examples of universal waste treatment units include a disassembly or removal area, a shredder and associated equipment, a glass crusher, an accumulation area, or a container staging or storage area. A container alone does not constitute a universal waste treatment unit. A universal waste treatment unit includes containers and the land or pad upon which they are placed.

Article 8. Standards for the Management of Universal Waste Solar Panels

§66273.80. Applicability.

This article applies to handlers of universal waste solar panels (as defined in section 66273.9).

§ 66273.81. Prohibition.

A handler of universal waste solar panels is:

- (a) Prohibited from disposing of the solar panels; and
- (b) Prohibited from diluting or treating the solar panels, unless the handler is responding to a release as provided in 66273.83.
- (c) Prohibited from exporting solar panels unless export is conducted in accordance with article 4 of this chapter, or with applicable export requirements for hazardous waste exports as described in chapter 12 of this division.

§ 66273.82. Notification Requirements for Handlers of Universal Waste Solar Panels.

(a) USEPA notification requirements.

(1) Except as provided in subsections (a)(2) and (b) of this section, a handler of universal waste solar panels shall have sent written notification of universal waste solar panel management to the Regional Administrator, and received a federal ID Number, before accumulating 5,000 kilograms of universal waste solar panels.

(2) A universal waste handler who has already notified the USEPA of the universal waste solar panel handler's hazardous waste management activities and has received an EPA Identification Number is not required to renotify pursuant to this section.

(b) A handler of universal waste solar panels who accumulates 5,000 kilograms of universal waste solar panels, but who would not be required to notify the Regional Administrator pursuant to 40 Code of Federal Regulations section 273.32(a)(1) because the universal waste solar panels handled are non-RCRA hazardous waste shall send written notification to the Department, and shall obtain an ID Number, as defined in section 66260.10, from the Department.

(c) The notifications made pursuant to sections (a) and (b) of this section shall include:

(1) The universal waste solar panel handler's name and mailing address;

(2) The name and business telephone number of the person at the universal waste solar panel handler's site who should be contacted regarding universal waste solar panel management activities;

(3) The address or physical location of the universal waste solar panel management activities;

(4) A list of all of the types of universal waste solar panels managed by the handler (e.g., thin-film, crystalline silicon);

(5) A statement indicating that the handler of universal waste solar panels is accumulating more than 5,000 kilograms of universal waste solar panels at one time and the types of universal waste solar panels (e.g., thin-film, crystalline silicon) the handler of universal waste solar panels is accumulating above this quantity.

§66273.83. Waste Management and Response to Releases.

(a) A handler of universal waste solar panels shall manage the solar panels in a manner that prevents releases of any ~~solar panels~~ hazardous constituents or any hazardous component of a solar panel to the environment under reasonably foreseeable conditions, as follows:

(1) A handler of universal waste solar panels shall contain any solar panel in a ~~container or package that is structurally sound, adequate to prevent breakage~~ manner that prevents release of hazardous constituents to the environment, the solar panel, and compatible with the contents of the solar panel. ~~Such a container or package. If a container is used, such a container shall lack evidence of leakage, spillage or damage that could cause leakage prevent the release of hazardous constituents~~ under reasonable foreseeable conditions.

(2) Intact solar panels that are managed in a manner that prevents ~~breakage of the solar panels and release of hazardous constituents~~ components of the solar panels to the environment under reasonably foreseeable conditions (e.g., stretch-film on a pallet) shall be deemed to comply with subsection (a)(1) of this section.

(3) A handler of universal waste solar panels shall immediately clean up and place in a container any solar panel that is broken and ~~shall place in a container any solar panel that shows evidence of breakage, leakage, or damage that could cause the release of solar panel glass or other~~ may be expected to cause a release of hazardous constituents to the environment under reasonably foreseeable conditions. The containers shall be structurally sound, compatible with the contents of the solar panels and ~~shall lack evidence of leakage, spillage or damage that could cause leakage or releases of solar panel glass or other hazardous constituents prevent releases of hazardous constituents~~ to the environment under reasonably foreseeable conditions.

~~(4) A handler of universal waste solar panels shall place solar panels in a container with packing materials, if such material is necessary to prevent breakage during handling, storage and transportation.~~

(b) A handler of universal waste solar panels shall immediately contain all releases of solar panels and of residues from solar panels to the environment.

(1) A solar panel generator shall determine whether any material resulting from such a release is a hazardous waste, and if so, shall manage the hazardous waste in compliance with all applicable requirements of this division. The handler of universal waste solar panels is the generator of the hazardous waste resulting from the release, and is subject to the requirements of chapter 12.

(c) Hazardous waste consisting only of broken, or otherwise damaged solar panels, but that still satisfy the definition of solar panel in section 66273.9 may be managed as universal waste provided that the broken, or otherwise damaged solar panel is repackaged according to the standards of this section.

(d) A universal waste solar panel handler, transporter, or collection facility may conduct the following activities:

(1) Removing wires from solar panels;

(2) Removing metal frames from solar panels; or

(3) Disassembling solar panels into individual components, modules or cells.

§ 66273.84. Labeling/ Marking.

(a) A handler of universal waste solar panels shall clearly label or mark solar panels (i.e., each solar panel), or a container or pallet in which solar panels are contained with the following phrase: "Universal Waste—Solar Panel(s)".

(b) In lieu of labeling individual solar panels and/or containers or pallets of solar panels pursuant to subsection (a) of this section, a handler of universal waste solar panels may accumulate universal waste solar panels within a designated area demarcated by boundaries that are clearly labeled with the following phrase: "Universal Waste—Solar Panel(s)".

§ 66273.85. Personnel Training.

(a) A handler of universal waste solar panels ensure that all personnel who manage solar panels at the handler's facility are thoroughly familiar with proper solar panel management and emergency response procedures relative to those persons' responsibilities, as specified in subsections (b) and (c) of this section.

(b) A handler of universal waste solar panels shall initially train and provide annually, thereafter, training to all personnel who manage or who supervise those who manage solar panels. Training materials shall be in the form of any written media (e.g., brochures, electronic mail, company letters, pamphlets, posters, etc.) and shall include the date of that material. This training shall include, at a minimum:

(1) The types and hazards associated with the solar panels that personnel may manage at the facility (e.g., hazards due to broken glass and cadmium in solar panels);

(2) The proper disposition of solar panels managed at the facility (e.g., the locations of solar panel containers, or the location of a centralized solar panel accumulation area);

(3) The proper procedures for responding to releases of solar panels (e.g., spilled solar panel glass) including the position titles and the means of contacting those personnel at the facility who are designated to respond to reports of releases (e.g., spilled solar panel glass) and/or to respond to questions received from other personnel at the facility; and

(4) The applicable requirements contained in this article regarding labeling, collecting, handling, consolidating, and shipping solar panels at the facility, including, but not limited to, the prohibition on the disposal of solar panels, and for personnel involved in shipping solar panels who are "hazmat employees", as defined in 49 Code of Federal Regulations section 171.8, the applicable requirements prescribed in 49 Code of Federal Regulations section 172.704.

(c) The handler of universal waste solar panels shall maintain a written record by date (e.g., a list of personnel who have received either initial or annual training information) indicating the names of personnel who received the information specified in subsection (b) of this section.

(d) The handler of universal waste solar panels shall maintain the record specified in subsection (c) of this section for at least three years from the date the person last managed any solar panels at the facility. The record of training for a "hazmat employee", as defined in 49 Code of Federal Regulations section 171.8, shall meet the applicable requirements of 49 Code of Federal Regulations section 172.704(d). The training record may accompany a person who is transferred within the same company.

§ 66273.86. Accumulation Time Limits.

(a) A handler of universal waste solar panels shall accumulate solar panels for no longer than one year from the date the solar panel was generated, or was received from another handler of universal waste solar panels.

(b) A handler of universal waste solar panels shall be able to demonstrate the length of time that the solar panel has been accumulated from the date it became a waste or was received. The handler of universal waste solar panels may make this demonstration by:

(1) Placing the solar panel in a container and marking or labeling the container with the earliest date that any solar panel in the container became a waste or was received;

(2) Marking or labeling the individual solar panel with the date it became a waste or was received;

(3) Maintaining an inventory system onsite that identifies the date the solar panel became a waste or was received;

(4) Maintaining an inventory system onsite that identifies the earliest date that any solar panel in a group of items of solar panels or a group of containers of solar panels became a waste or was received;

(5) Placing the solar panel in a specific accumulation area and marking or labeling the area to identify the earliest date that any solar panel in the area became a waste or was received; or

(6) Any other method which clearly demonstrates the length of time that the solar panel has been accumulated from the date it became a waste or was received.

§ 66273.87. Offsite Shipments.

(a) A handler of universal waste solar panels is prohibited from sending or taking solar panels to a place other than another handler of universal waste solar panels, a destination facility, or a foreign destination.

(b) If a handler of universal waste solar panels self-transport solar panels offsite, the handler becomes a universal waste transporter for those self-transportation activities and shall comply with the universal waste transporter requirements of article 5 of this chapter while transporting the solar panels.

(c) If a solar panel being offered for offsite transportation meets the definition of hazardous material pursuant to 49 CFR parts 171 through 180, a handler of universal waste solar panels shall package, label, mark and placard the shipment, and prepare the proper shipping papers in accordance with the applicable Department of Transportation regulations pursuant to 49 CFR parts 172 through 180;

(d) Prior to sending a shipment of solar panels to another handler of universal waste solar panels or to a destination facility, the originating handler of universal waste solar panels shall ensure that the receiving handler of universal waste solar panels or destination facility agrees (e.g., verbal or written communication) to receive the shipment.

(e) If a handler of universal waste solar panels sends a shipment of solar panels to another handler of universal waste solar panels or to a destination facility and the shipment is rejected by the receiving handler of universal waste solar panels or destination facility, the originating handler of universal waste solar panels shall either:

(1) Receive the solar panel(s) back when notified that the shipment has been rejected; or

(2) Agree with the receiving handler of universal waste solar panels on a destination facility to which the shipment will be sent.

(f) A handler of universal waste solar panels may reject a shipment containing solar panels, or a portion of a shipment containing solar panels that the handler has received from another handler of universal waste solar panels. If a handler of universal waste solar panels rejects a shipment or a portion of a shipment, the handler shall contact and notify the originating handler of universal waste solar panels of the rejection and to discuss reshipment of the load. The handler of universal waste solar panels shall:

(1) Send the shipment back to the originating handler of universal waste solar panels; or

(2) If agreed to by both the originating and receiving handler of universal waste solar panels, send the shipment to a destination facility.

(g) If a handler of universal waste solar panels receives as solar panels, a shipment containing hazardous waste that is not a solar panel, the handler of universal waste solar panels shall immediately notify the Department of the illegal shipment, and provide the name, address, and telephone number of the originating shipper. The Department will provide instructions for managing the hazardous waste.

(h) If a handler of universal waste solar panels receives as solar panels, a shipment of nonhazardous waste, the handler of universal waste solar panels shall manage the nonhazardous waste in any way that is in compliance with applicable

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federal, state and local solid waste regulations.

§66273.88. Tracking Solar Panel Shipments.

(a) Receipt of shipments. A handler of universal waste solar panels shall keep a record of each shipment of solar panels received at the handler's facility. The record may take the form of a log, invoice, manifest, bill of lading, or other shipping document. The record for each shipment of solar panels received shall include the following information:

(1) The name and address of the originating handler of universal waste solar panels from which the solar panels were sent;

(2) The quantity [count or weight] of solar panels received; and

(3) The date of receipt of the shipment of solar panels.

(b) Shipments offsite. A handler of universal waste solar panels shall keep a record of each shipment of solar panels sent from the handler's facility to another facility. The record may take the form of a log, invoice, manifest, bill of lading or other shipping document. The record for each shipment of solar panels sent shall include the following information:

(1) The name and address of the handler of universal waste solar panels or destination facility to which the solar panels were sent;

(2) The quantity [count or weight] of solar panels sent;

(3) The date of departure of the shipment of solar panels.

(c) Record retention.

(1) A handler of universal waste solar panels shall retain each record described in subsection (a) of this section for at least three years from the date of receipt of the corresponding shipment of solar panels.

(2) A handler of universal waste solar panels shall retain each record described in subsection (b) of this section for at least three years from the date of departure of the corresponding shipment of universal waste.